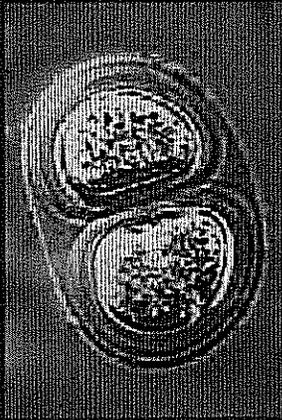


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# Phytoplankton



Free-living algae suspended in the water column

Primary producers, form the base of the food web

In the presence of sufficient light and nutrients, populations can "bloom"

Blooms can contribute to oxygen depletion, fish kills, and aesthetic problems

Phytoplankton community problems are often the first indicators of anthropogenic stress

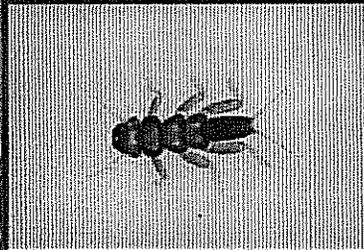
Exponent

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## Benthic macroinvertebrates

- Illinois River dominant taxa**
- Lumbricidae (Oligochaete worms)**
- Berosus* (water beetle)**
- Psephenus* (water penny beetle)**
- Neoperla* (stonefly)**
- Stenelmis* (riffle beetle)**
- Stenonema* (mayfly)**



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(USEPA 2004)

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**Used 11 indicators in a weight-of-evidence approach (water quality, habitat, biological)**

**Downstream-most sites, near OK border, not significantly impacted**

**Robust fish and macroinvertebrate communities despite elevated nutrients**

(USEPA 2004)

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Table E-3 Weight-of-Evidence Summary for Illinois and Kings Rivers

Station	Sampling Event	Water Chemistry						Habitat		Ecological Characteristics			Indicators impacted (per event)	Total Number of Indicators impacted (all events)	Conclusions (based on all events)	
		DO (min)			DC-Sat			Riffle	Pool	Periphyton	Filamentous	Benthos				Fish
		DO	min		DC	Sat	TP									
OSG20UP	1	0	0	0	0	0	0	0	0	X	0	0	0	1	Unimpacted	
	2	0	0	0	0	0	0	0	0	-	-	0	0	0		
	3	X	X	0	0	0	0	-	-	-	-	-	-	2		
OSG20DN	1	0	0	0	X	0	0	0	0	X	0	X	X	4	Slightly Impacted	
	2	0	0	0	X	0	0	0	0	-	-	X	0	2		
	3	-	-	-	X	-	-	-	-	-	-	-	-	1		
SPG21UP	1	0	0	0	0	0	0	X	X	X	0	X	0	5	Slightly Impacted	
	2	0	0	0	0	0	0	X	X	-	-	X	0	2		
	3	-	-	-	-	-	-	-	-	-	-	-	-	0		
SPG21DN	1	-	-	-	-	-	X	X	0	X	X	X	X	7	Severely Impacted	
	2	X	0	0	X	X	0	0	0	-	-	X	X	5		
	3	0	X	X	X	X	-	-	-	-	-	-	-	4		
OSG20	1	0	0	X	X	X	X	0	0	X	-	0	0	8	Impacted	
	2	0	0	X	0	X	0	0	0	-	-	0	0	2		
	3	0	0	X	0	X	0	-	-	-	-	-	-	2		
MJD02UP	1	0	X	0	0	0	0	X	0	X	0	X	0	6	Slightly Impacted	
	2	X	0	0	0	0	0	0	0	-	-	X	0	2		
	3	-	-	-	-	-	-	-	-	-	-	-	-	0		
MJD02DN	1	X	X	0	X	0	0	X	X	0	0	X	0	7	Impacted	
	2	0	0	0	X	0	0	X	0	-	-	X	0	3		
	3	-	-	-	X	X	-	-	-	-	-	-	-	2		
MJD02S	1	X	X	0	0	0	0	X	0	X	0	0	0	4	Slightly Impacted	
	2	X	X	0	X	0	0	0	0	-	-	0	0	3		
	3	-	-	-	-	-	-	-	-	-	-	-	-	0		
ILL022	1	0	0	0	X	0	0	X	0	X	0	0	0	4	Slightly Impacted	
	2	0	0	0	X	0	0	0	0	-	-	-	-	1		
	3	-	-	-	X	0	-	-	-	-	-	-	-	1		
ILL020	1	0	0	0	X	0	0	0	0	X	0	0	0	2	Unimpacted	
	2	0	0	0	X	0	0	0	0	-	-	0	0	1		
	3	-	-	-	X	0	-	-	-	-	-	-	-	1		
SPAC46	1	0	0	0	0	0	0	0	0	X	0	0	0	1	Unimpacted	
	2	0	0	0	0	0	0	0	0	-	-	0	0	0		
	3	-	-	-	-	-	-	-	-	-	-	-	-	0		
FLT031	1	0	0	0	0	0	0	0	0	0	0	0	0	0	Unimpacted	
	2	0	X	0	0	0	0	0	0	-	-	0	0	1		
	3	0	0	0	X	0	0	0	0	-	-	0	0	1		

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# EPA Biological Assessment

## Station ILL020

“Unimpacted”

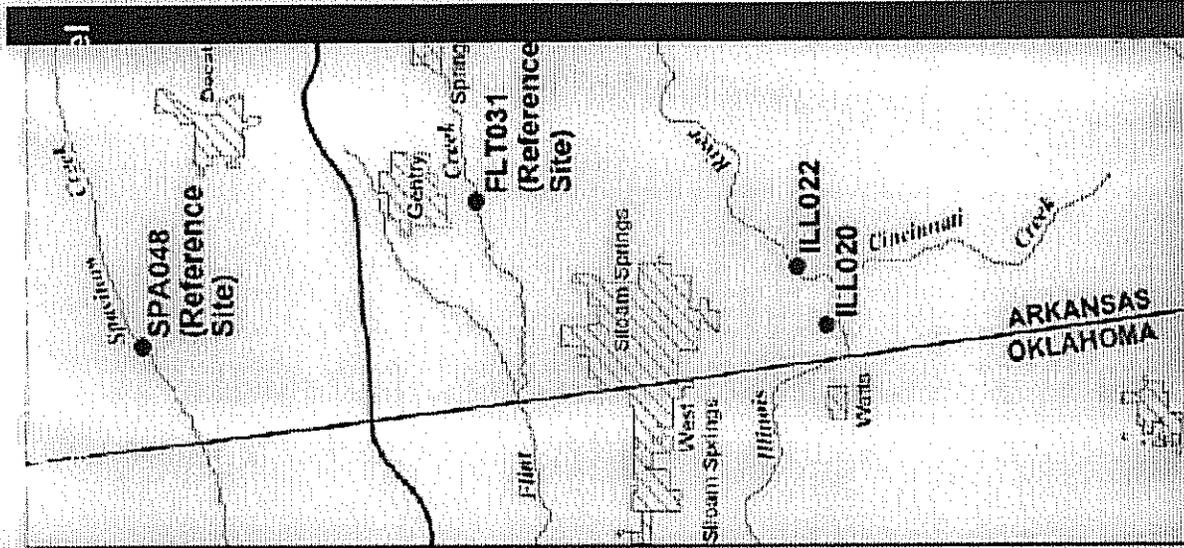
(Although impacted based on total phosphorous, periphyton)

## Station ILL022

“Slightly impacted”

(Based on phosphorous, DO, habitat, and periphyton)

(USEPA 2004)



Eponent

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## Algal and periphyton growth was highest below WWTPs

“The taxonomic analyses of algal data collected from natural substrates at each site suggest that the periphytic community within the Illinois River basin has been altered below WWTP outfalls.”

“That site, located below the Springdale WWTP outfall, showed the highest [periphyton] productivity of all sites on the Illinois River.”

(USEPA 2004)

E<sup>2</sup>ponent

Ginn007110